

**U.S. FISH AND WILDLIFE SERVICE  
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: *Chorizanthe parryi* var. *fernandina*

COMMON NAME: San Fernando Valley spineflower

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: July 2006

**STATUS/ACTION**

☐ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status

☐ New candidate

☒ Continuing candidate

☐ Non-petitioned

☒ Petitioned - Date petition received: December 14, 1999; February 29, 2000

☐ 90-day positive - FR date:

☐ 12-month warranted but precluded - FR date:

☐ Did the petition request a reclassification of a listed species?

**FOR PETITIONED CANDIDATE SPECIES:**

a. Is listing warranted (if yes, see summary of threats below)? Yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for each of these actions has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions. During the past 12 months, almost all our budget for listing actions has been needed to prepare various listing actions to comply with court orders and court-approved settlement agreements. We will continue to monitor the status of *Chorizanthe parryi* var. *fernandina* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our internet website.

(<http://endangered.fws.gov/>).

☐ Listing priority change

Former LP: ☐

New LP: ☐

Date when the species first became a Candidate (as currently defined): July 1, 1975

☐ Candidate removal: Former LPN: ☐

☐ A – Taxon is more abundant or widespread than previously believed or not subject to

the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

\_\_\_ U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

\_\_\_ F – Range is no longer a U.S. territory.

\_\_\_ I – Insufficient information exists on biological vulnerability and threats to support listing.

\_\_\_ M – Taxon mistakenly included in past notice of review.

\_\_\_ N – Taxon does not meet the Act’s definition of “species.”

\_\_\_ X – Taxon believed to be extinct.

#### ANIMAL/PLANT GROUP AND FAMILY:

Flowering plants: Polygonaceae (buckwheat family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:

California, Los Angeles and Ventura Counties

LAND OWNERSHIP: State of California, Private

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#### BIOLOGICAL INFORMATION

##### Species Description

*Chorizanthe parryi* var. *fernandina* is a low growing herbaceous annual plant. Germination occurs following the onset of late-fall and winter rains and typically represents different cohorts from the seed bank. Flowering occurs in the spring, generally between April and June.

*Chorizanthe parryi* var. *fernandina* grows up to 30 cm in height and 5 to 40 cm across. Leaves are oblong to oblanceolate, 5 to 40 mm in length, and forming a basal rosette. The involucre is urn shaped, with six bracts and straight awns enclosing its small white flowers, which measure 2.5 to 3 mm in diameter (Hickman 1993). *Chorizanthe parryi* var. *fernandina* can generally be differentiated from co-occurring spineflowers, including *Chorizanthe staticoides* and *Lastarriaea coriacea* by its decumbent habit, white flowers, entire leaves and straight-tipped involucral awns. Plants become desiccated and die by late summer, leaving branches brittle and dry but intact with involucres still attached and containing seed. *Chorizanthe parryi* var. *fernandina* disarticulates (breaks apart) with clumps of four to eight involucres that are rigidly held together. In contrast, the involucres of *Chorizanthe staticoides* and *Lastarriaea coriacea* disarticulate readily and one-by-one.

## Taxonomy

*Chorizanthe parryi* var. *fernandina* was first described as *Chorizanthe fernandina* by Watson in 1880. The type specimen was collected in 1879, from San Fernando Canyon near the San Fernando railroad station (CDFG 2004). In 1923, Jepson revised the taxonomy and renamed it *Chorizanthe parryi* var. *fernandina* and it has been considered a valid taxon since. *Chorizanthe parryi* var. *fernandina* is a member of the Polygonaceae family and is among 50 taxa in the genus *Chorizanthe* that occur in western North America and southwestern South America (Hickman 1993).

## Habitat/Life History

Based upon historical collections, *Chorizanthe parryi* var. *fernandina* occurred in sandy to gravelly soils, often in washes, and mostly in coastal sage scrub (Reveal 1979). Apparently, *Chorizanthe parryi* var. *fernandina* was also collected in some areas with relatively deep soils in coastal sage scrub (Glenn Lukos & Associates 1999). Contrary to some historical data, recent information from investigations conducted on the site of the plant's rediscovery (after being considered extinct for 70 years) indicates that it occurs in sparsely vegetated areas with thin or highly mineralized soils (i.e., low organic content) (Sapphos Environmental 2001a). The conditions under which *Chorizanthe parryi* var. *fernandina* is able to persist are most likely due to the decreased competition from native and nonnative plants on thin soils, where other plants cannot become established. *Chorizanthe parryi* var. *fernandina* and related annuals do not fare well if shaded by taller plants or forced to compete for water and nutrients (McGraw and Levin 1998). The invasion of nonnative grasses and weeds in southern California in the last few decades, which grow profusely in deeper or disturbed soils, may explain the disappearance of *Chorizanthe parryi* var. *fernandina* from some historical locations, and the current observation of the species primarily on thinner, mineralized soils (Sapphos 2001a). Also, of the 12 historical occurrences, the sites in San Bernardino, Orange, and Los Angeles Counties no longer support suitable habitat for *Chorizanthe parryi* var. *fernandina* as those areas have been extirpated by urbanization (Reveal and Hardham 1989; Schierenbeck 1995; CNPS 2001).

The pollination ecology of *Chorizanthe parryi* var. *fernandina* has been studied (Sapphos Environmental 2002). These studies indicate that the flowers are most often visited by ants (*Dorymyrmex pyramicus*), and this is consistent with the flower type (i.e., other ant-pollinated flowers are small with low nectar yield). However, ants are not efficient pollinators, and the rate of fruit set measured by the researchers was high, which would indicate another, more effective pollinator was visiting the plants. The study revealed that honeybees (*Apis mellifera*) showed a strong constancy (carrying pollen of one plant species) for *Chorizanthe parryi* var. *fernandina* and visited the flowers fairly often (Sapphos Environmental 2002). Honeybees were the second most common visitors to the flowers of *Chorizanthe parryi* var. *fernandina*, followed by another ant (*Solenopsis xylonii*), and two beetles (*Dasytinae* sp. and *Zabrotes* sp.). The results of these pollination studies have implications for the conservation of *Chorizanthe parryi* var. *fernandina* as the continued pollination, seed production, and germination of the plant will rely upon a healthy, mostly native, insect community that cannot exist in the face of urbanization and

competition from nonnative ants, such as the Argentine ant (*Linepithema humilis*), that often accompany human development.

#### Historical Range/Distribution

*Chorizanthe parryi* var. *fernandina* was thought to be extinct since the last collection was made in 1929 (Reveal and Hardham 1989). This taxon had been collected in the late 1800s and early 1900s from Los Angeles County, near the city of Santa Ana in Orange County, and an unspecified area in San Bernardino County. The majority of the historical collections of *Chorizanthe parryi* var. *fernandina* from the greater Los Angeles metropolitan area were made in areas where urban, agricultural, and industrial development have replaced native habitats (Reveal and Hardham 1989). Prior to its rediscovery at Ahmanson Ranch in Ventura County (see below) in the late spring of 1999, the most recent collection was made in 1929 from Castaic in Los Angeles County.

*Chorizanthe parryi* var. *fernandina* is known historically from California in the area of Elizabeth Lake and Castaic, south through the San Fernando Valley in Los Angeles County, to near Santa Ana in Orange County, and from a single location on the coastal side of the mountains in San Bernardino County. The 20 known historical collections (before 1999) may be divided into 12 general localities; 10 in Los Angeles County, one in Orange County based on specimens collected in 1902, and a generalized locality in San Bernardino County based on a specimen collected in 1876 (Goodman 1934; Reveal and Hardham 1989).

#### Current Range/Distribution

The plant currently is known from two disjunct localities: the first is in the southeastern portion of Ventura County on a site known as Ahmanson Ranch, and the second is in an area of southwestern Los Angeles County known as Newhall Ranch. Investigations of historical locations and seemingly suitable habitat within the range of the species have not revealed any other occurrences (Sapphos 2001a).

#### Population Estimates/Status

Although reported here, counts of individuals of an annual plant species are somewhat meaningless because the number of individuals can fluctuate widely from year-to-year, sometimes not germinating at all if conditions are too dry. Therefore, the number of individuals reported may be as much a reflection of rainfall as it is population size. The areal extent or distribution of the populations is a more appropriate measure of the species' population size, and where available, the areal extent of the populations is presented.

At the Ahmanson Ranch site in 1999, when *Chorizanthe parryi* var. *fernandina* was first rediscovered, biologists estimated the number of individual plants at between 5,000 and 10,000 (LSA Associates 1999). Further investigation that same year revised the number of individual plants to 23,000 over almost 6 acres (ac) (2.4 hectares (ha)) (Sapphos Environmental 2001a). In 2000, new populations were discovered and the number of individual plants, estimated at

approximately 1.5 million over more than 10 ac (4 ha), was greater than in 1999 as a result of favorable weather during the winter and spring of 1999-2000 (Sapphos Environmental 2001a). Our current information indicates that the Ahmanson Ranch population is composed of 18 sub-populations of various sizes, all located within 0.3 mile (mi) 0.5 kilometers (km) of each other, and occupying approximately 12.9 ac (5.2 ha) (Sapphos Environmental 2001b; 2003).

The Newhall Ranch population of *Chorizanthe parryi* var. *fernandina* was discovered in 2000; however, 2000 survey data did not include population estimates (Newhall Land & Farming 2004). In 2001, surveys revealed 14,750 *Chorizanthe parryi* var. *fernandina* plants at two sites on Newhall Ranch. Results from 2002 surveys included population estimates for the senescent remains of *Chorizanthe parryi* var. *fernandina* plants that were observed during the 2002 surveys. Because it was not possible to determine what year these plants germinated, these plants were labeled pre-2002. Pre-2002 plants were estimated to include 3,153,194 individuals, while plants in 2002 were estimated to include 7,814 individuals. In 2003, surveys estimated populations of *Chorizanthe parryi* var. *fernandina* totaling 5,775,458 individuals (Newhall Land & Farming 2004). In 2004, the total population of *Chorizanthe parryi* var. *fernandina* at Newhall Land was estimated to be 525,388 individuals. In 2005, the total population of *Chorizanthe parryi* var. *fernandina* at Newhall Land was estimated to be 7,223,570 individuals.

DISTINCT POPULATION SEGMENT (DPS) N/A

## THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range. Prior to its rediscovery at Ahmanson Ranch in 1999, 20 collections of *Chorizanthe parryi* var. *fernandina* were made by 16 individuals at 12 locations, with the most recent from the vicinity of Castaic in 1929 (Reveal and Hardham 1989). During the last few decades, numerous field botanists had been unable to locate the species, even where historically recorded, largely due to the alteration and loss of suitable habitat (Reveal and Hardham 1989). The best evidence we have suggests that *Chorizanthe parryi* var. *fernandina* is extirpated from all of the 12 general areas where it was originally collected. Chatsworth Park, site of the 1901 collection, is approximately 6 mi (10 km) from the Ahmanson Ranch site where urbanized Los Angeles County borders the more rural lands of southeastern Ventura County

The previous owner of Ahmanson Ranch, Washington Mutual, had attained approval for a development project in 1992, which was re-certified by the County of Ventura on November 24, 1992 (County of Ventura 2002). The approved development would have destroyed approximately 75 percent of the total occurrences of *Chorizanthe parryi* var. *fernandina* on the site. We and the California Department of Fish and Game were working with the developer to redesign its project to protect more of the plants until August 2003, when the State of California announced it had offered to purchase the Ahmanson Ranch property. Washington Mutual accepted the State's offer, and the land fell into public ownership in November 2003. It is now under the auspices of the Santa Monica Mountains Conservancy, a joint powers authority operated by the State to conserve lands within the Conservancy's sphere of influence. We believe the direct threats to the species from the former Ahmanson Ranch development plan

have been eliminated, and we are working with the new landowners to manage the site for the benefit of *Chorizanthe parryi* var. *fernandina*.

The Newhall Ranch population of *Chorizanthe parryi* var. *fernandina* is within the footprint of a proposed development of more than 20,000 homes, commercial structures, and infrastructure. The land was recently purchased from Newhall Land and Farming Company by Lennar Homes and the new owner intends to proceed with the development. The proposed project has been approved by the County of Los Angeles, but some legal issues from opponents remain before the project can begin. The California Department of Fish and Game (CDFG) was notified by an anonymous source in 2002 that the previous landowner (Newhall Land and Farming) had destroyed undisclosed occurrences of the plant on its property (the species is State-listed as endangered under the California Endangered Species Act (CESA) and is afforded limited protection under CESA). An investigation by CDFG discovered numerous remains of *Chorizanthe parryi* var. *fernandina* on the property in areas that had been graded in preparation for an agave farm (Liotta 2002). The District Attorney chose not to pursue prosecution under CESA.

Representatives of Newhall Ranch informed us that they intended to pursue a Candidate Conservation Agreement with Assurances (CCAA) for the plant. We received a draft CCAA from Newhall Land & Farming on January 31, 2005. The preliminary plan shows that the developer would avoid removing approximately 74 percent of the area the plant is believed to occupy (Newhall Land & Farming 2004); however, the level of detail available was not sufficient for us to conclude that the preserved populations would be appropriately buffered from adjacent land uses, or that sufficient native vegetation would remain in proximity to the preserved areas to support a pollinator community. The CCAA is still in review and negotiation with the applicant.

The threats to *Chorizanthe parryi* var. *fernandina* from habitat destruction or modification are less than they were 2 years ago. One of the two populations is in permanent, public ownership and is being managed by an agency that is working to conserve the plant. The other population is under threat of development; however, if the CCAA can be developed with the landowner, it is possible that the remaining plants can also be conserved. Until such an agreement is finalized, the threat of development and the potential damage to the Newhall Ranch population remains, as shown by the destruction of some plants during installation of an agave farm.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

This factor is not known to be applicable

C. Disease or predation.

We found no evidence that disease is a factor affecting this species, nor did we find evidence that predation by livestock or wildlife is a current threat to this species. The Ahmanson Ranch site had been heavily grazed by sheep in the past, and the Los Angeles County sites are grazed by cattle.

D. The inadequacy of existing regulatory mechanisms.

Currently, *Chorizanthe parryi* var. *fernandina* is not protected under Federal law. In June 2000, the species became a candidate for listing as endangered by the State of California, and was listed as endangered in August 2001. Under CESA, the Department of Fish and Game is allowed to issue permits for the take of candidate and state-listed plants that is incidental to otherwise lawful activities. However, some activities, including mining, logging, and agriculture, are exempted from the requirement to apply for a permit. On private lands, the federal ESA comes into play when there is a federal nexus to a proposed project. Under section 7 of the ESA, the lead federal agency is required to consult with the Service if the proposed project would adversely affect a federally listed species.

The California Environmental Quality Act (CEQA) requires a full disclosure of the potential environmental impacts of proposed projects. The lead agency is the public agency with primary authority or jurisdiction over the project, and is responsible for conducting a review of the project and consulting with other agencies concerned with the resources affected by the project. Protection of listed species through CEQA depends on the discretion of the lead agency involved.

For example, Los Angeles County approved the Newhall Ranch CEQA documents with the knowledge that several other federally- and State-listed species were present on Newhall's property, including *Vireo bellii pusillus* (least Bell's vireo), *Empidonax traillii extimus* (southwestern willow flycatcher), *Gasterosteus aculeatus williamsoni* (unarmored threespine stickleback), and *Bufo californicus* (arroyo toad). Despite findings of significance of the impacts to these resources, the County had the discretion under CEQA to determine that the impacts could be mitigated, or that other overriding considerations would allow the proposed development to proceed. Therefore, the adequacy of CEQA in protecting sensitive resources is limited to the discretion of the local jurisdiction and may not be effective for species such as *Chorizanthe parryi* var. *fernandina*.

E. Other natural or manmade factors affecting its continued existence.

*Chorizanthe parryi* var. *fernandina* may be threatened by invasive nonnative plants, including grasses, which could potentially displace it from available habitat; compete for light, water, and nutrients; and reduce survival and establishment. A study of the endangered *Chorizanthe pungens* var. *hartwegiana* (McGraw and Levin 1999) implicated shade as the primary factor affecting the survival, reproduction, and biomass of *Chorizanthe*. Current research and management approaches are inadequate to control the problem of nonnative plant invasions (Hobbs and Humphries 1995; Schierenbeck 1995).

*Chorizanthe parryi* var. *fernandina* is particularly vulnerable to extinction due to its concentration in two isolated areas (Barrett and Kohn 1991). The existence of only two areas of occurrence, and a relatively small range, makes the variety highly susceptible to extinction or extirpation from a significant portion of its range due to random events such as fire, drought, erosion, or other occurrences (Shaffer 1981, 1987; Meffe and Carroll 1997). Such events are not usually a concern unless the number of populations or geographic distribution is severely limited, as is the case with *Chorizanthe parryi* var. *fernandina*. Once the number of populations or the plant population size is reduced, the remnant populations, or portions of populations, have a higher probability of extinction from random, chance events (Primack 1998)

## CONSERVATION MEASURES PLANNED OR IMPLEMENTED

In November 2003, the State of California purchased the Ahmanson Ranch property. The property and the population of *Chorizanthe parryi* var. *fernandina* on Ahmanson Ranch is now under the auspices of the Santa Monica Mountains Conservancy, a joint powers authority operated by the State to conserve lands within the Conservancy's sphere of influence. We believe the direct threats to the species from the former Ahmanson Ranch development plan have been eliminated, and we are working with the State to manage the site for the benefit of *Chorizanthe parryi* var. *fernandina*.

Representatives of Newhall Ranch informed us that they intended to pursue a CCAA for *Chorizanthe parryi* var. *fernandina*, and presented us with a preliminary plan on January 31, 2005, that would avoid removing approximately 74 percent of the area the plant is believed to occupy (Newhall Land & Farming 2004). At this time, the level of detail available is not sufficient for us to conclude that the preserved populations would be appropriately buffered from adjacent land uses, or that sufficient native vegetation would remain in proximity to the preserved areas to support a pollinator community. The document is currently in review and negotiation with the applicant. Much of the conservation strategy has been developed in cooperation with the California Department of Fish and Game.

The threats to *Chorizanthe parryi* var. *fernandina* from habitat destruction or modification are less than they were 2 years ago. One of the two populations is in permanent, public ownership and is being managed by an agency that is working to conserve the plant. The other population is under threat of development; however, if the CCAA can be developed with the landowner, it is possible that the remaining plants can also be conserved. Until such an agreement is finalized, the threat of development and the potential damage to the Newhall Ranch population remains.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate)

For species that are being removed from candidate status:

\_\_\_ Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

## RECOMMENDED CONSERVATION MEASURES

We will be working with the landowner of the Los Angeles County site (Newhall Ranch) to develop a conservation strategy in conjunction with approved development plans. The landowner has proposed developing a CCAA. The other site is in State ownership and is being managed for conservation by a local land conservancy. The land conservancy is proposing to implement the protections developed by the previous landowner with the Service, and has closed sections of the land to public access to protect *Chorizanthe parryi* var. *fernandina*.



## LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
<b>High</b>	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	<b>Non-imminent</b>	Monotypic genus	4
		Species	5
		<b>Subspecies/population</b>	<b>6*</b>
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

*Magnitude:* *Chorizanthe parryi* var. *fernandina* is known to currently exist as only two populations. Proposed development projects at one population site have the potential to cause the loss of most, if not all, of the remaining plants at that location. All of the plants, including those on preserved public lands, are also under potential threat by competition from nonnative plants (e.g., nonnative grasses); stochastic events, such as erosion; and the potential loss of the native pollinator community to competition with, and predation by, the nonnative *Linepithema humilis* (Argentine ants). Considering the number and types of threats to the survival of *Chorizanthe parryi* var. *fernandina*, the magnitude of these threats is considered high.

*Imminence:* Formerly, the threats to *C. parryi* var. *fernandina* were considered imminent because the two locations where the species occurs were proposed for residential developments, and both of the projects had been approved by the local government agencies with jurisdiction over development. The site in Ventura County is now in permanent ownership of the State of California and is being managed for conservation of its biological resources. At the site in Los Angeles County, development was expected to begin in 2004; however, the landowner has approached the Service to develop a CCAA and development is on hold for several reasons. The potential exists for a stochastic event to cause the loss of one or both populations. The loss of either population would put the plant at immediate risk of extinction given the various threats to its survival.

Rationale for Change in Listing Priority Number (insert if appropriate)

\_\_\_\_ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted?

Emergency listing is not warranted at this time because approximately one-half of the known occurrences of *Chorizanthe parryi* var. *fernandina* are protected on State-owned land, and the other half of the species' occurrences are expected to be protected under a CCAA.

#### DESCRIPTION OF MONITORING

All monitoring of *Chorizanthe parryi* var. *fernandina* has been, and continues to be, performed by the respective landowners of the two properties where the species occurs. Prior to the Ahmanson Ranch site coming into State ownership, the land was privately-owned and Service biologists were not invited to participate in monitoring. Similarly for the Newhall Ranch site, which remains in private ownership, the landowner did not invite nor allow the Service or other government agencies to conduct monitoring. We received regular updates on the status of the species on the Ahmanson Ranch site since the species was re-discovered in 1999; we have recently received reports from the Newhall Ranch site in preparation for the CCAA.

#### COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: None of them.

Indicate which State(s) did not provide any information or comments: All of them.

#### LITERATURE CITED

Barrett, S., and J. Kohn. 1991. Genetic and evolutionary consequences of small population size in plants: Implications for conservation. In: Falk, D., and K. Holsinger, eds. Genetics and conservation of rare plants. Center for Plant Conservation, Oxford University Press. Pp. 3-30.

California Department of Fish and Game (CDFG). 2004. Rarefind: An application of the California Natural Diversity Data Base, Sacramento, California.

California Native Plant Society (CNPS). 2001. Inventory of the rare and endangered plants of California (sixth edition). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor, California Native Plant Society, Sacramento, CA. 388 pp.

County of Ventura. 2002. Draft supplemental environmental impact report for Ahmanson Ranch Phase A Master Tract Map, Tentative Tract No. 5206, February 2002. State Clearinghouse Number 89041908. Ventura, CA.

- Glenn Lukos & Associates. 1999. Report: biology of the San Fernando Valley Spineflower, Ahmanson Ranch, California. Prepared for Ahmanson Land Company, Calabasas, CA.
- Goodman, G.J. 1934. A Revision of the North American Species of the genus *Chorizanthe*. *Annals of the Missouri Botanical Garden* 21(1): 50-80.
- Hickman, J. C. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley. 1400 pp.
- Hobbs, Richard J. and Stella E. Humphries. 1995. An integrated approach to the ecology and management of plant invasions. *Conservation Biology* 9(4):761-770.
- Liotta, P. 2002. Return to search warrant issued by Los Angeles Superior Court Magistrate, David S. Wesley on May 21, 2002. Affidavit filed by Officer Penelope Liotta of the California Department of Fish and Game on May 30, 2002. Los Angeles, CA.
- LSA Associates. 1999. San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) – Supporting Information for a Petition to the United States Fish and Wildlife Service. Prepared for the City of Calabasas. Submitted by Myers, Widders, Gibson & Long, LLP, Ventura, CA.
- McGraw, J. M. and A. L. Levin. 1999 [1998]. The roles of soil type and shade intolerance in limiting the distribution of the edaphic endemic *Chorizanthe pungens* var. *hartwegiana* (Polygonaceae). *Madrono* 45(2):119-127.
- Meffe, G.K. and C.R. Carroll. 1997. Demographic processes. pp. 217-218 in: *Principles of Conservation Biology*. Sinauer Associates, Sunderland, MA.
- Newhall Land & Farming. 2004. Data submitted on current distribution and densities of *Chorizanthe parryi* var. *fernandina* on Newhall Land & Farming property. Submitted during a meeting on January 27, 2004, Ventura Fish and Wildlife Office, Ventura, CA.
- Primack, R.B. 1998. Minimum viable populations. pp. 280-304 in: *Essentials of Conservation Biology*. Sinauer Associates, Sunderland, MA.
- Reveal, J. L. 1979. *Chorizanthe parryi* var. *fernandina*, rare plant status report. California Native Plant Society. 2 pp.
- Reveal, J. L. and C. B. Hardham. 1989. A revision of the annual species of *Chorizanthe* (Polygonaceae: Eriogonoideae). *Phytologia* 66(2):98-198.
- Sapphos Environmental. 2001a. An investigation of the San Fernando Valley spineflower for the Ahmanson Land Company. Prepared for Ahmanson Land Company by Sapphos Environmental, Inc., Pasadena, CA.

- Sapphos Environmental. 2001b. Analysis of potential impacts to the San Fernando Valley spineflower with Respect to the Ahmanson Ranch Project. Prepared for the Ahmanson Land Company, Calabasas, CA.
- Sapphos Environmental. 2002. The pollination biology of the San Fernando Valley spineflower, *Chorizanthe parryi* var. *fernandina*, (S. Watson) Jepson. Prepared for Ahmanson Land Company, Calabasas, CA.
- Sapphos Environmental. 2003. 2081(a) permit annual progress report for the San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)/Spring 2002 Introduction Pilot Study Conducted at Ahmanson Ranch, Ventura County, CA. Submitted to California Department of Fish and Game, Species Conservation and Recovery Program, Sacramento, CA.
- Schierenbeck, K. A. 1995. The threat to the California flora from invasive species, problems and possible solutions. *Madroño* 42(2):168-174.
- Shaffer, M. L. 1981. Minimum population sizes for species conservation. *Bioscience* 31(2):132-134.
- Shaffer, M.L. 1987. Minimum viable populations: coping with uncertainty. pp. 69-86 in: *Viable Populations for Conservation*; M.E. Soulé, ed. Cambridge University Press, Cambridge, MA.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: /s/ Paul Henson April 26, 2006  
Acting CNO Manager, Fish and Wildlife Service Date



Concur:  August 23, 2006  
Acting Director, Fish and Wildlife Service Date

Do not concur:   
Director, Fish and Wildlife Service Date

Date of annual review:  
Conducted by: